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Dear Giedre,

Response to Offshore Electricity Transmission: Consultation on tender exercises under the enduring regime
by Siemens Energy

Introduction

This response to the Ofgem consultation Ref: 178/11 is on behalf of Siemens Energy. We have also contributed to the Renewable UK response and support the points made in it.

Siemens is the market leading design & build contractor for offshore grid connections. We provide a range of asset services to OFTOs. We are also the leading supplier of offshore wind turbines and a co-investor in three UK offshore wind projects. We therefore have a unique and detailed understanding of the assets affected by the OFTO regime and the technical and commercial processes involved in both creating and servicing them.

The development of the offshore transmission regime has matured over several years and, during this evolution, interested parties have all developed a deeper understanding of the issues. These issues are complex and we can see no one simple right way to deliver offshore connections.

Siemens is keen to work with Ofgem and others to deliver a successful regime. The success of this regime is important to us and to the future of offshore wind in the UK. We are grateful for the various opportunities we have had to work with Ofgem and we would like to continue this engagement.

Our response is in 2 parts, the first is a discussion of key issues for the OFTO regime. The second is a chapter by chapter response to the consultation document.

A successful OFTO regime

Siemens wants to see a successful OFTO regime, where both generator and OFTO build options are viable. We believe that having more than one active business model will allow a wider range of industry players and financial structures that will bring benefits to customers. We also believe that it will allow a faster build rate for offshore wind in the UK than is possible now; where for a number of reasons projects are built by utility companies, largely

on their balance sheets. This enlarged market would have a significant effect on the emergence of a UK based supply chain and ability to reduce the cost of offshore wind.

The consultation covers two of the three timing options. We agree that at this stage the best use of available resources is to concentrate on “Generator Build” and “Late OFTO Build” models, as these are likely to be needed first. We believe that in the medium term “Early OFTO Build” will also have a role and may be especially valuable for delivering coordinated network assets that serve multiple parties and carry onshore power flows. We would like to see Ofgem announce a clear timetable for the development of this option.

The major focus of the consultation is on the “Late OFTO Build” model. We urge Ofgem also to complete the full development of the “Generator Build” model and resolve the outstanding issues with it. Weaknesses with the OFTO build options would not be helped by making “Generator Build” more difficult.

A viable “OFTO Build” option (early or late) would avoid the need for Generators to raise hundreds of millions of pounds in extra capital to fund their grid connections, although there would still be liabilities for the OFTO’s work. If other factors were equal, they would naturally choose this option but we believe that the “Late OFTO Build” option, as presented in the consultation document, would have significant dis-benefits for developers such that they are unlikely to choose to use it in this form.

The Ofgem tender process is just one part of a very complex process to deliver offshore wind. It needs to be developed in that context, not become an end in itself in the desire for pure competition in one element of the whole. We do not believe it possible to deliver the many conflicting objectives of the regime in a single tender process, no matter how well designed.

We therefore believe that “OFTO build” should work along side “Generator Build” but to make it a viable option will require more flexibility from Ofgem over the timing of the tender, the contracting models used and the ability of Generators to commit to longer lead time items. This would lead to a less clear cut tender process, but would allow the OFTO regime to deliver successful projects.

Aims and benefits of an OFTO regime

As mentioned above, the offshore transmission network is a means to an end. It is an enabler to offshore renewable generation which is a much larger investment and has a much greater impact on present and future electricity customers than the transmission assets themselves. It is important that decisions on the detail of the OFTO regime do not lose sight of this wider perspective and are made in this context. The first test of any proposed feature of the regime should be that it ***supports the delivery of the UK’s offshore wind programme and is not perceived as a barrier***.

Once assets are created it is relatively straightforward to incentivise that they are managed efficiently and very difficult to change them. The main challenge for the regime is therefore that it supports the timely creation of efficient assets, i.e. it promotes delivery of the

- right asset
- at the right time
- for the lowest cost (of energy)
- with the lowest risk to customers

There will be trade offs between these aims, e.g. zero customer risk is achievable but at the price of a later, less optimum and more costly network.

Given the wider benefit to customers that is enabled by the asset, we believe that the focus of the regime and the tender process should be on delivering the right asset at the right time and only then seeing how this can be done for the lowest cost. Risks may be taken on behalf of customers where the risks and benefits are properly assessed and it is clearly in customers' interests.

Ofgem has stated many objectives for the OFTO regime, some of which are mutually exclusive. The intent behind some proposals in the consultation appears to be focussed on what we would consider to be lesser objectives. It is our concern that over-regulation of some details is likely to impact on the industries ability to deliver. We would prefer Ofgem to focus on broad principles and let industry develop and refine competing delivery models.

Delivering the right asset

There has been significant discussion of what the "right" asset may be as part of the work on offshore transmission coordination. For the purposes of this consultation response we will assume that the Generator correctly identifies the right asset at a high level, either to build itself or to trigger the OFTO process.

The tender process then needs to support the development of the detail of this solution in a way that is efficient. Given the complexity and scale of grid connections this requires an extended and iterative engagement between the generator and supply chain. Consents need to be sought for a workable solution which often involves detailed work by key suppliers. Value engineering with suppliers during project development often leads to significant improvements in the solution and reduction in cost to customers.

During the OFTO tender process, whenever this occurs, there is a need for ongoing engagement with the supply chain in order to avoid a hiatus in the project. In models where an OFTO takes over responsibility for delivery before construction the tender process needs to allow for the transition to be made in a way that safeguards all parties and does not damage the project.

We believe that rules to prevent developers making commitments to the supply chain would create a discontinuity in the process that would lead to less efficient assets.

Timely Delivery

Timeliness of delivery is vital to the ability of generators to finance their projects. There are 2 aspects to timeliness:

- Making connection capacity available when expected
- Starting grid construction sufficiently early to reduce the elapsed time between wind farm FID and delivery of first power.

The lead time for transmission assets is generally greater than that lead time for the wind farm they connect. The grid connection must be energised for the arrival of the first wind turbine. Thus grid construction is always on the critical path for the connecting wind farm. If construction of the grid connection is enabled to start early enough the overall critical path of an offshore wind farm can be reduced by as much as 2 years, (see below). This can benefit project IRR by several percentage points and therefore reduce the overall cost of energy to customers. ***Starting grid construction earlier reduces the cost of offshore wind energy.***

The time to start grid construction to maximise project IRR is usually before FID for the wind farm and may even be before consent is achieved. This means someone must take the risk of possibly abortive work. Customers have shown they are willing to do this on real projects to a limited degree. Generators have made a financial commitment to start grid construction before FID on every one of the 6 offshore grid connections Siemens has built in the UK and often have invested in design work before consent.

This has been in an incremental commitment with the level of authorisation rising as both the project scope and outturn cost become more certain. This is the "natural" way to deliver a complex and risky project. Financial commitment increases as confidence in the outturn grows.

The flexibility to make early and incremental commitment to grid is automatically available under the "Generator Build" option but the model for "OFTO Build" described in the consultation would prevent any commitment to the supply chain by an OFTO until its License is granted, ruling out any earlier start to the grid connection. This model both results in a later connection and forces a single all-or-nothing moment of commitment on the Generator that may not align with other key investment decisions.

We recommend that the regime should facilitate work starting sufficiently early so as not to delay generation, or add cost to generation because of increased risk of delay.

The consequential cost of a late connection is much greater than the financing cost arising from the connection being ready early**.** ***Construction of grid connection assets a little early is much better than construction too late***.

Other factors that impact on OFTO workability

The OFTO regime exists in the context of many issues beyond Ofgem's control, e.g. a consenting process which is lengthy and uncertain, the requirements of project finance, or lead times for construction that are hard to influence. It is the interaction between these things and the OFTO regime that results in the workability of the OFTO tender process. It may be helpful to highlight the following 'facts of life' which may not be obvious, but impact on the viability of the process outlined by Ofgem.

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Construction Lead times

It takes over three years to build an offshore grid connection from the day a construction contract is awarded to the first power on. HVDC connections take a little longer due to complexity and physical size, but even AC connections take about three years.

Included at the beginning of this period is detailed electrical design, allowing specification of wound components such transformers, reactors etc. Design of the wound components then provides information on size, weight and access requirements of those items as input into the design of the offshore platform structure. Once designed, fabrication of the structure is followed by installation and onshore testing of the electrical system, float out, hook up, cold commissioning and energisation. It is difficult to see how this time can be reduced significantly even with a degree of standardisation.

The lead time for connection is thus longer than the lead time for wind farm construction. The power needs to be on the day the first wind turbine arrives, so the OFTO process is always on the critical path for the wind farm that it will connect.

Design and Build Contracts

Construction contracts for offshore grid assets are awarded on a design and build basis. The main contractor or consortium takes responsibility for design as part of their contract. This is for the simple reason that it makes a single entity responsible for delivering a system that works, meets grid code and will be accepted onto the network by the GBSO. The cost to the wind farm of delay or refusal of its connection is so significant that other options where design and construction responsibilities might be split are unlikely to be bankable. Thus, even where some design work has been done pre-contract the first thing the contractor must do is validate and take responsibility for the design from first principles.

Wind farms are electrically complex with many active components. Every point on the onshore grid has different characteristics that also change according to system loading and configuration. This means that even where “standard” solutions are developed, some one off adjustment is required.

The detailed studies necessary to ensure a workable solution represent months of work and require specialist modelling tools that have been developed in house by the contractors. HVDC systems, reactive compensation and control systems are each proprietary to their manufacturers, so each contractor’s solution will be different.

Some of the input data for this modelling is not available until late in the project and the modelling and design are highly iterative. This means that neither the customer nor the contractor can know at the time of contract award the precise details of the solution that will eventually be delivered.

For these reasons early engagement with potential contractors is vital to ensure the eventual design can be made to work. A collaborative rather than confrontational procurement strategy facilitates this iterative process and there is scope for value engineering with a preferred contractor identified at an early stage. It is noted that alliance contracting is one potential lever for cost reduction being pursued by the Off-shore Wind Cost Reduction Task Force

and work streams feeding it. In particular lessons can be learnt from the work of PILOT on the oil and gas sector, which promoted cost reduction through collaborative alliance contract structures.

We believe that alliance contracting can deliver faster, lower cost offshore connections subject to there being an appropriate initial selection process to ensure the competence and competitiveness of the selected contractor.

Delivering at lowest cost

Cost of finance

Perhaps the greatest success of the OFTO regime so far has been its ability to attract very low cost finance for the Generator Built assets. The predictable income via the GBSO, even for low availability, allows high gearing and low debt service cover ratios. The link to RPI makes it ideal for institutional investors with long term RPI linked cash flows. This model should continue to work well for "Generator Build" projects under the enduring regime.

For "OFTO Build" it will be harder at the point of tendering to attract such competitive rates for finance. The first 4 years will include construction risk, suiting a different type of investor with a higher expected return. It will be hard to predict the rates that will be available on refinancing after construction 4 years in advance. With or without a refinancing claw back the cost to customers of financing OFTO assets during their operating lives under the "OFTO Build" model will be higher than "Generator Build".

We urge Ofgem to consider the total cost of financing both the wind farm and its grid connection when considering options. It may be acceptable to have higher financing costs for the regulated OFTO assets if the changed risk profile improves the cost of finance for the wind farm asset, (usually about 4 to 5 times the value.)

Fair value

It is a significant concern to wind farm developers that the transfer valuation of the grid asset by Ofgem will be lower than the actual cost incurred to create it. Whilst there is a growing number of examples of ex-post valuations the process is still based on hindsight and hard to predict. Concern over how they will be treated by Ofgem is constraining the procurement strategies of generators to options that are simple to defend to Ofgem, rather than those which result in lower outturn cost.

Ofgem's default preference for demonstrating costs are efficient is for appointment of suppliers to be made by competitive tender and the selection of the lowest competent bid. As discussed above, such a single stage tender does not help deliver the best outturn cost for offshore grid connections. The final scope will only be known after the chosen design and build contractor has completed the design and some as constructed data is available. The focus needs to be on outturn cost rather than up front bid price. Alliancing, target costing, and other models are more suited to these complex assets.

As one of the potential contractors, Siemens fully recognises the need for electricity customers to be assured that contracts for construction of OFTO assets represent fair value. There are many ways to do this other than a

simplistic lowest bid process. We would like to engage with Ofgem and Generators to agree in advance a range of mechanisms for demonstrating fair value. These might include for example price bridge comparisons with other projects.

We believe that electricity customers have significantly more to gain by allowing generators and OFTOs to engage with their supply chain early and collaboratively.

Risk to customers

Ofgem and DECC's work on coordinated design, with the Offshore Transmission Coordination Advisory Group (OTCG) of which Siemens has been a part, has shown that it can be in the interests of electricity customers to accept some well managed risks. Ofgem is about to publish a consultation on this work including proposals for anticipatory investment. We look forward to working with Ofgem on this subject.

Conclusion

We would reiterate that we welcome the opportunity to work with Ofgem to deliver a successful regime. Success of this regime is important to delivery of UK offshore windfarm capacity and to employment in both our transmission business and our proposed UK wind turbine facility. We would like to continue this engagement.

Yours sincerely,

For and on behalf of:

Siemens Transmission and Distribution Limited

Matthew Knight

Business Development Manager

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Comments on chapters in the consultation document

Chapter 2

Q2.1

We agree that at this stage the best use of available resources is to concentrate on “Generator Build” and “Late OFTO Build” models, as these are likely to be needed first. We believe that in the medium term “Early OFTO Build” will also have a role and may be especially valuable for delivering coordinated network assets that serve multiple parties and carry onshore power flows. We would like to see Ofgem announce a clear timetable for the development of this option.

2.15 – 2.19

We note Ofgem and DECC are working on commissioning and hand over arrangements which is a significant issue for generators.

Chapter 3

Generally the process outlined in this chapter seems to assume that grid connections are designed by a generator. The fixed and clear design is then procured on a multi contract basis by the chosen OFTO and that the time to do this does not impact on the offshore generator. In reality none of these will be the case. The assets are complex and the Generator will have to engage significantly with potential suppliers in order to develop sufficient detail for a consent application.

If the bidding OFTOs have to start from scratch the wind farm will get connected up to 2 years later than if the Generator had chosen to do himself. It is also not clear how suppliers might operate in a world where the ‘customer’ changes part way through the process.

For example a far from shore wind farm might wish to do optioneering to decide between an AC or DC connection and then whether to build a 500MW or 1,000MW DC link for one or 2 wind farms to connect. The solutions offered by different suppliers would use cables of different DC voltages and design, possibly affecting the number, spacing and routing of cables and size and location of substations. Some resolution would be required in order to obtain appropriate rights to land and consents. The generator will therefore have constrained the options for the successful OFTO through what is consented. If the Generator is not able to make any commitment to the supply chain this may prove costly and inefficient when the OFTO starts to engage the supply chain from scratch.

We therefore believe there must be flexibility in the tender process to allow generators to make commitments to suppliers before OFTO selection.

3.23 We note the use of the phrase “efficient and effective procurement practices..” We would like confirmation that the assumed measure of efficiency is based on the incentivisation of delivery performance and outturn

cost and that alliancing and other collaborative procurement models will be regarded as efficient.

3.24 We see no reason why OFTOs should be better or worse at procurement than Generators. However constraining the timing and participants of the procurement process is likely to result in a poorer outcome.

3.25 It is difficult to see how a single OFTO that is bidding for a license in competition with others would be able to secure supply chain capacity in advance of being made preferred bidder. Ofgem has previously discouraged the idea of OFTOs teaming up with suppliers on an exclusive basis.

Q 3.8 For the reasons above, we do not agree that ensuring all procurement is undertaken by OFTOs would be the most economic and efficient approach. If the tender process makes this restriction we believe it would be unlikely that generators would choose the "Late OFTO build" option.

3.26 As discussed above contracts are likely to be let on a design and build basis and the overall delivery time will be around 3 years or more. This duration is not driven by supply chain constraints, but by the critical path activities to deliver these complex assets. HVDC delivery times are longer than AC, due to the larger scale of structures required and the longer detailed design process, not due to any lack of competition in the supply chain.
There are likely to be issues over validity periods for supplier's offers. The OFTO selection process will add several months between the date by which contractors must bid and the date at which an OFTO could be awarded a license and in turn commit to the supplier. Suppliers of cables, power transformers and other items that tie up significant factory slots are unlikely to be able to hold slots or fix prices for extended and indeterminate periods.

Q 3.9 Suppliers are ready to invest in new capacity but are concerned that the market will not appear or may be delayed. Any constraints are likely to be of limited duration if and when the market gets going. Many component parts are not specific to offshore wind connection connections and come from the global market for power equipment, so the UK market is not likely to have a major impact on availability world wide.
The greatest constraint is likely to be expertise in a number of fields, especially electrical engineers. Preparing variant bids for several potential OFTO customers in parallel would tie up significant quantities of this scarce resource and could even result in reluctance to bid all of the potential OFTOs if their requirements are different.

3.28 and 3.29 Flexibility for generators to engage suppliers may make the process less clear cut, but might also be the only way to deliver some projects on time. Each of the potential "inefficiencies" listed by Ofgem could also apply to OFTO procurement if the circumstances were unfavourable. We cannot agree that Ofgem's minded to position represents the best interests of customers or the UK's offshore wind programme.

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3.33 A non binding commitment is unlikely to have any serious meaning. Either a commitment can be made or not.

3.76 The statement that Ofgem "may take factors such as transmission losses into account" [in assessing efficiency] implies that Ofgem may or may not do so. We would ask Ofgem to make a clear and unambiguous statement that losses will be assessed at the value of the equivalent electrical energy at that point in the system. i.e. once beyond the meter a lost kwh has already attracted a subsidy for the generator. The design should value losses at the full price.